



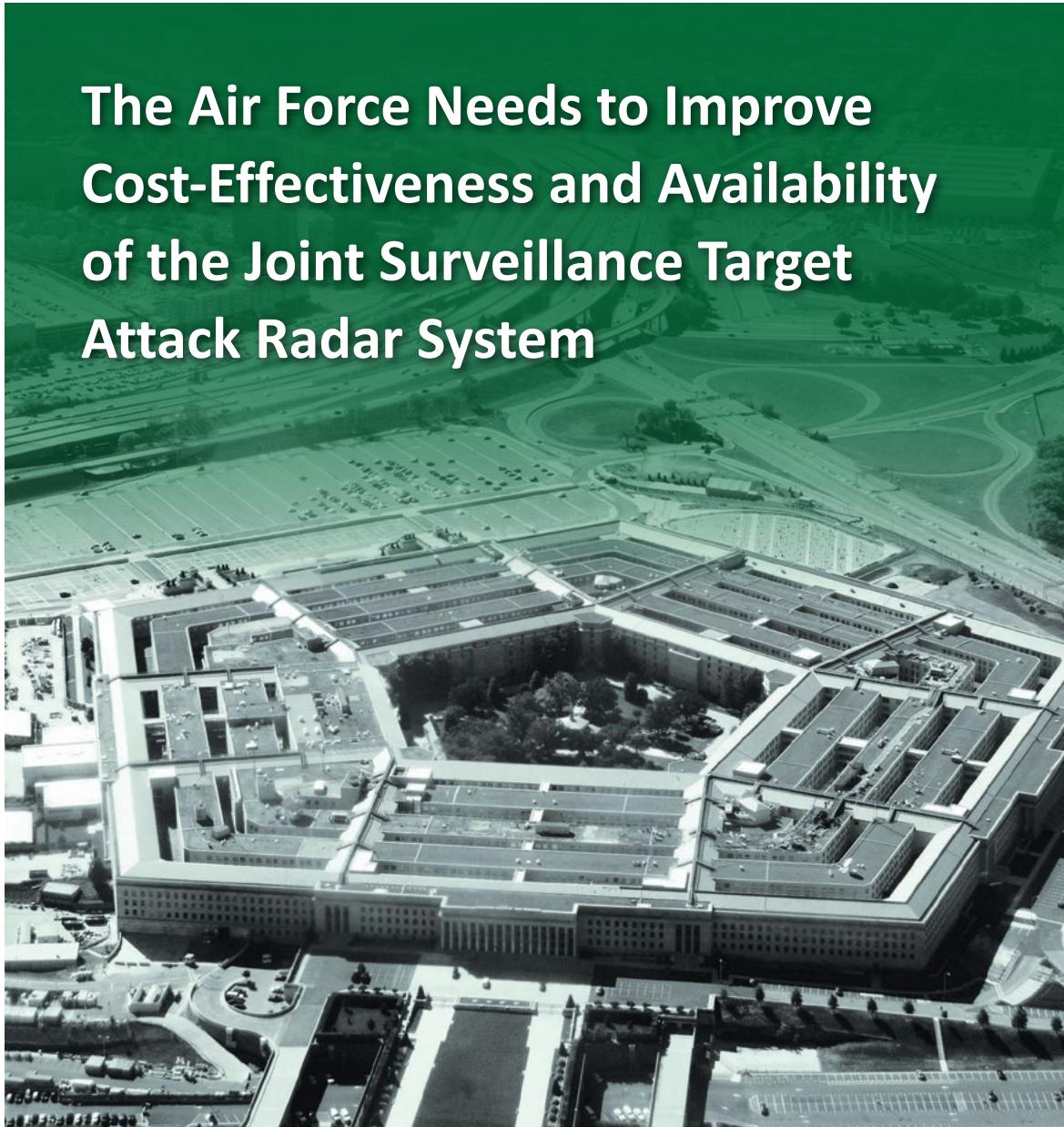
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INSPECTOR GENERAL

U.S. Department of Defense

NOVEMBER 1, 2016

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System



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Results in Brief

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System

November 1, 2016

Objective

We determined whether the Air Force made cost-effective purchases on the performance-based logistics contract to support the E-8C Joint Surveillance Target Attack Radar System (JSTARS) aircraft.

Background

The 116th and 461st Air Control Wings maintain a fleet of 16 E-8C aircraft and 1 E-8A aircraft trainer to conduct ground surveillance to support offensive operations and targeting and perform Battle Management, Command and Control missions. The E-8C JSTARS aircraft is a pre-owned modified Boeing 707-300 series aircraft loaded with radar, communication, and operations and control equipment.

On September 15, 2000, the Air Force Space and Special Systems awarded a cost-plus-award-fee¹ contract to Northrop Grumman Corporation to provide Total System Support Responsibility services to sustain 16 E-8C JSTARS aircraft. These services include program management, engineer technical support, supply chain and spare parts management, flight crew training, technical data, and customer support. The Total System Support Responsibility contract is valued at \$7 billion, with a 6-year base period and 16 annual contract option periods. We reviewed contract option periods 11.5 to 15, which cover May 2011 through October 2015. Contract option period 11.5 was not a full-year option due to delays in contract negotiations.

¹ A cost-plus-award-fee contract is a cost-reimbursable contract that provides a fee for the contractor that consists of a base amount fixed at the beginning of the contract and an award amount based on an evaluation by the Government, sufficient to motivate the contractor to provide excellent performance on the contract.

Finding

The JSTARS contracting officer did not promote cost-effectiveness on the Total System Support Responsibility contract for sustainment support of the E-8C JSTARS aircraft. This occurred because the JSTARS contracting officer did not:

- establish adequate oversight procedures to validate whether Northrop Grumman's proposed over and above work² for standard repairs³ was appropriate;
- establish an aircraft availability metric requirement that was consistently achieved and satisfied the Air Control Wing users' need to have aircraft available for their mission;
- establish an appropriate cost performance incentive that is designed to motivate the contractor to reduce contract costs; and
- properly manage portions of the award fee allocated for aircraft availability and cost performance requirements.

As a result, the JSTARS contracting officer paid unallowable award fees totaling \$7.6 million, which could have been put to better use. Also, the JSTARS program management office spent \$1.1 billion from May 2011 through October 2015 for contract option periods 11.5 to 15 without achieving its acquisition objective to increase aircraft availability while reducing sustainment cost. Furthermore, the ability of the Air Control Wings to meet their mission was impacted because aircraft were not available. Additionally, the JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or to use another platform for JSTARS.

² Over and above work is work discovered while performing overhaul, maintenance, and repair efforts that, while within the general scope of the contract, is not covered by basic work contract line items but necessary to satisfactorily complete the contract.

³ Standard repairs refers to repair procedures included in Boeing's repair manual for the 707 aircraft.



Results in Brief

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System

Recommendations

We recommend that the Senior Center Contracting Official, Robins Air Force Base, direct the contracting officer to:

- verify the appropriateness of all contractor-proposed over and above work;
- establish evaluation criteria in the award-fee plan for contract option period 17 that adequately motivate Northrop Grumman to reduce contract costs;
- determine if the unallowable award fees paid from November 2013 through October 2015 during contract option periods 14 and 15, totaling \$7.6 million, can be recovered through contractual remedies or a voluntary refund; and
- conduct periodic reviews of the JSTARS Total System Support Responsibility contract to ensure its compliance with the Federal Acquisition Regulation and Air Force guidance.

Additionally, we recommend that the Program Executive Office for Battle Management:

- develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the JSTARS contracting officer in determining whether contractor-proposed over and above work is appropriate; and
- direct the JSTARS program manager to perform a service-life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate operational capability risks.

We also recommend that the Program Executive Officer for Battle Management direct the JSTARS program manager, with support from the JSTARS contracting officer, to revise the sustainment performance metric requirement on the follow-on contract for option period 17. Specifically, we recommend that the Air Force relate the availability requirement to the Air Control Wing user's desired outcome for aircraft availability.

Management Comments and Our Response

Comments from the Program Executive Officer for Battle Management, in collaboration with the Senior Center Contracting Official, Robins Air Force Base, addressed all specifics of the recommendations and no further comments are required. Please see the Recommendations Table on the next page.

Recommendations Table

Management	Recommendations Requiring Comment	No Additional Comments Required
Senior Center Contracting Official, Robins Air Force Base		1
Program Executive Officer for Battle Management		2, 3

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**INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500**

November 1, 2016

**MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR
ACQUISITION, TECHNOLOGY, AND LOGISTICS
ASSISTANT SECRETARY OF THE AIR FORCE
(FINANCIAL MANAGEMENT AND COMPTROLLER)**

SUBJECT: The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (Report No. DODIG-2017-003)

We are providing this report for information and use. The contracting officer did not promote cost-effectiveness on the performance-based contract for sustainment of the E-8C JSTARS aircraft and mismanaged the award fee, resulting in payments of \$7.6 million that could have been put to better use. During contract option periods 11.5 to 15, the contracting officer spent \$1.1 billion for a degraded mission capability while contract costs increased. We conducted this audit in accordance with generally accepted government auditing standards.

We considered management comments on a draft of this report when preparing the final report. Comments from the Program Executive Officer for Battle Management, in collaboration with the Senior Center Contracting Official, Robins Air Force Base, conformed to the requirements of DoD Directive 7650.03; therefore, we do not require additional comments.

We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-9077 (DSN 664-9077).

Jacqueline L. Wicecarver
Jacqueline L. Wicecarver
Assistant Inspector General
Acquisition and Sustainment Management

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Introduction

Objective

We determined whether the Air Force made cost-effective purchases on the performance-based logistics (PBL) contract to support the Joint Surveillance Target Attack Radar System (JSTARS). See Appendix A for scope and methodology and prior coverage related to the audit objectives.

Background

E-8C JSTARS Aircraft

The E-8C JSTARS aircraft, shown in Figure 1, is a pre-owned Boeing 707-300 series aircraft modified with radar, communications, and operations and control equipment. The Air Force purchased pre-owned Boeing 707-300 series aircraft with an average service age of 32 years and limited maintenance history. The 116th and 461st Air Control Wings maintain a fleet of 17 JSTARS aircraft, including 16 E-8C aircraft and 1 E-8A aircraft trainer, at Robins Air Force Base, Georgia. The Air Control Wings use the E-8C JSTARS aircraft to conduct ground surveillance to support offensive operations and targeting. Additionally, the Air Control Wings use the aircraft to perform Battle Management, Command and Control missions.



Figure 1. E-8C JSTARS Aircraft
Source: Air Force.

JSTARS Program Management

The Program Executive Officer (PEO) for Battle Management, headquartered at Hanscom Air Force Base, Massachusetts, reports to the Assistant Secretary of the Air Force (Acquisition). The PEO for Battle Management has two missions. The PEO is responsible for the JSTARS program and supports the Air Force Life Cycle Management Center (AFLCMC) by organizing, training and equipping the Battle Management directorate and its divisions. AFLCMC, headquartered at Wright-Patterson Air Force Base, Ohio, is responsible for the total life-cycle management of all aircraft, engines, munitions, and electronic systems. AFLCMCs mission is to provide affordable and sustainable capabilities to U.S. personnel and global partners, on time and at cost.

The mission of the PEO for Battle Management is to develop, acquire, and sustain capability to support:

- aerospace management,
- air operations command and control,
- mission planning,
- intelligence,
- theater battle control,
- airborne battle management,
- missile warning,
- space control sensors,
- joint operations and force application planning,
- force protection, and
- weather operations.

The Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR) Division is the subordinate activity under the PEO for Battle Management.

The C2ISR Division is responsible for a variety of systems that collect, process, and disseminate intelligence information needed by national security and military officials. The JSTARS program management office (PMO), located at Robins Air Force Base, is responsible for oversight of the JSTARS program. The JSTARS PMO reports directly to the Chief, C2ISR Division.

Total System Support Responsibility Contract

On September 15, 2000, the Air Force Space and Special Systems awarded a contract⁴ to Northrop Grumman Corporation to provide Total System Support Responsibility (TSSR) services to sustain the E-8C JSTARS aircraft. The TSSR services include program management, engineer technical support, supply chain and spare parts management, flight crew training, technical data, and customer support. The TSSR contract goals are to maximize aircraft availability and training effectiveness and reduce cost.

The TSSR contract is a cost-plus-award-fee contract,⁵ valued at \$7 billion, with a 6-year base period and 16 annual contract option periods. For this audit, we reviewed contract option periods 11.5 to 15, which covered May 2011 through October 2015. Contract option period 11.5 was not a full year due to delays in contract negotiations. Contract option period 16 began on November 1, 2015, and ends on October 31, 2016, while the follow-on contract option period 17 is scheduled to begin on November 1, 2016. The Air Force pays an award fee to Northrop Grumman based on successful performance in the following four weighted evaluation areas:

- aircraft availability,
- warfighter support,
- cost-performance-to-contract-estimate, and
- customer support.

(FOUO) The evaluation period for the award fee occurs two times per contract option period.

Review of Internal Controls

DoD Instruction 5010.40⁶ requires DoD organizations to implement a comprehensive system of internal controls that provides reasonable assurance that programs are operating as intended and to evaluate the effectiveness of the controls. We identified internal control weaknesses related to cost-effective purchases made by the Air Force on the performance-based logistics (PBL) contract to support JSTARS. Specifically, the JSTARS contracting officer did not establish adequate oversight procedures to validate the appropriateness of proposed over

⁴ Contract F09603-00-D-0210.

⁵ A cost-plus-award-fee contract is a cost-reimbursable contract that provides a fee for the contractor that consists of a base amount fixed at the beginning of the contract and an award amount based on a judgmental evaluation by the Government, sufficient to motivate the contractor to provide excellent performance on the contract.

⁶ DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013.

and above repair work;⁷ establish an effective and consistently achieved aircraft availability metric requirement; or establish a cost-performance incentive that adequately motivated the contractor to reduce cost. Additionally, the JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or use another platform for JSTARS. We will provide a copy of the report to the senior official responsible for internal controls in the Air Force.

⁷ Over and above work is work discovered while performing overhaul, maintenance, and repair efforts that, while within the general scope of the contract, is not covered by basic work contract line items, but is necessary to satisfactorily complete the contract.

Finding

Contracting for Sustainment of JSTARS Needs to Be More Effective

The JSTARS contracting officer did not promote cost-effectiveness on the TSSR contract for sustainment support of the E-8C JSTARS aircraft. This occurred because the JSTARS contracting officer did not:

- establish adequate oversight procedures to validate whether Northrop Grumman's proposed over and above work for standard repairs⁸ was appropriate;
- establish an aircraft availability metric requirement that was consistently achieved and satisfied the 116th and 461st Air Control Wings' need to have aircraft available for their mission;
- establish an appropriate cost performance incentive that is designed to motivate the contractor to reduce contract costs; and
- properly manage portions of the award fee allocated for aircraft availability and cost performance requirements.

As a result, the JSTARS contracting officer paid unallowable award fees totaling \$7.6 million, which could have been put to better use. Also, we reviewed TSSR contract option periods 11.5 to 15 and determined that the JSTARS PMO spent \$1.1 billion without achieving its acquisition objective to increase aircraft availability while reducing sustainment cost. Furthermore, the ability of the Air Control Wings to meet their mission was impacted because aircraft were not available. Additionally, the JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or to use another platform for JSTARS.

Background on the E-8C JSTARS Aircraft Operating Environment

(FOUO) In October 1989, after Boeing's closure of the 707 production line, the Defense Acquisition Board decided that the Air Force would purchase pre-owned Boeing 707-300C aircraft as the airframe (the body of the aircraft) for the JSTARS. The Air Force purchased the 707-300C aircraft, with limited maintenance histories, from multiple domestic and foreign government and commercial sources. The

⁸ Standard repairs refers to repair procedures included in Boeing's repair manual for the 707 aircraft.

(FOUO) Boeing 707-300C aircraft were converted to the E-8C aircraft to support the JSTARS mission. The E-8C aircraft conversion involved refurbishing the Boeing 707-300C airframe to bring it into compliance with Federal Aviation Administration mandates for aging aircraft. However, the conversion did not completely restore the service life⁹ of the airframes, which had an average service age of 32 years at the time of purchase. According to an Air Force E-8C assessment report,¹⁰ [REDACTED]

[REDACTED]

As the E-8C fleet's service life has degraded, the over and above repair costs from the beginning to the end of each TSSR period of performance for TSSR contract option periods 11.5 to 15 have increased an average of \$35 million annually. As of December 22, 2015, the JSTARS PMO had paid \$1.1 billion, which included over and above repair costs, to Northrop Grumman for TSSR contract option periods 11.5 to 15. The contract line item number charged for the over and above costs also included other costs, such as program depot maintenance, support for the trainer aircraft, and management of the technical publications. Table 1 shows the total contract costs for each TSSR option period from 11.5 to 15.

Table 1. Total Contract Costs for TSSR Contract Option Periods 11.5 to 15 (as of December 22, 2015)

TSSR Contract Period	Expenses	Award-Fee	Contract Costs
11.5	\$102,652,035	\$11,207,101	\$113,859,136
12	206,075,760	23,379,679	229,455,439
13	199,430,310	22,678,275	222,108,585
14	207,367,647	26,562,840	233,930,487
15	263,089,359	30,218,320	293,307,679
Total Costs	\$978,615,111	\$114,046,215	\$1,092,661,326

Source: DoD OIG.

Despite the risks associated with the previous acquisition decision to purchase pre-owned aircraft, DoD Directive 5000.01¹¹ states that program managers must develop and implement PBL strategies that improve total system availability while minimizing cost and the size of spare parts inventory. Additionally, the Directive states that trade-off decisions involving cost, service life, and effectiveness must consider corrosion prevention and mitigation.

⁹ Service life refers to the amount of time that an aircraft can fly before it can no longer fly or undergoes major rework.

¹⁰ "Air Force Fleet Viability Board E-8C Assessment Report," May 29, 2009.

¹¹ DoD Directive 5000.01, "The Defense Acquisition System," November 20, 2007.

Air Force Oversight of Over and Above Work for Standard Repairs Was Inadequate

The JSTARS contracting officer did not establish adequate oversight procedures to validate whether the contractor's proposed over and above work for standard repairs at the Lake Charles Maintenance and Modification Center (LCMMC), Lake Charles, Louisiana, was appropriate. Instead, the JSTARS contracting officer inserted a TSSR contract clause¹² that allowed Northrop Grumman to determine the over and above repairs required. However, the Defense Federal Acquisition Regulation Supplement 252.217-7028¹³ requires the administrative contracting officer to bilaterally or unilaterally establish over and above work procedures that cover Government review, verification, and authorization of the work. Specifically, the clause states that the Government must verify that the proposed over and above repair work is appropriate. Despite the Defense Federal Acquisition Regulation Supplement requirement, the Government did not verify the appropriateness of the over and above work for standard repairs performed under the TSSR contract.

JSTARS contracting officer inserted a TSSR contract clause that allowed Northrop Grumman to determine the over and above repairs required.

According to the JSTARS PMO and officials at the Defense Contract Management Agency (DCMA), none of the contractor-proposed over and above work for standard repairs was validated for appropriateness. Northrop Grumman determined the over and above repairs that were needed, as stated in the TSSR contract clause. According to the clause, to streamline administration of over and above work, the JSTARS contracting officer and Northrop Grumman agreed to an estimated cost for over and above repair work within a specific level of effort¹⁴ prior to contract award.

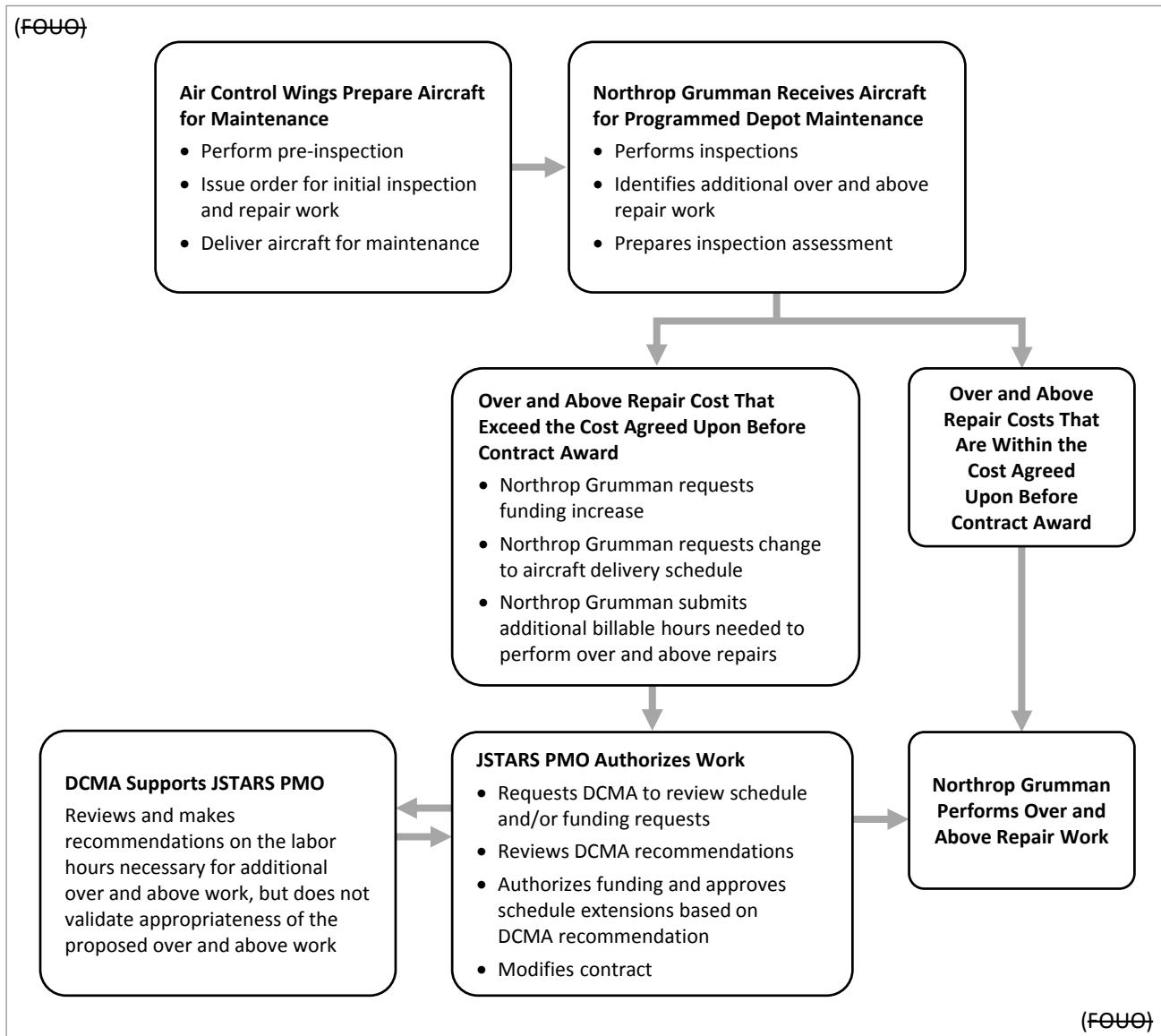
However, Government officials did not verify the appropriateness of the over and above work for standard repairs performed under the TSSR contract.

For standard over and above repairs that exceeded the estimated level of effort and cost, JSTARS and DCMA officials evaluated whether the number of labor hours to perform the proposed over and above work was necessary. However, Government officials did not verify the appropriateness of the over and above work for standard repairs performed under the TSSR contract, as required. Figure 2 shows the over and above review process for standard repairs.

¹² Clauses H-952, "Responsibility for Scheduled and Unscheduled Maintenance Performed at the Contractor's Facilities," and H-953, "Depot Maintenance Unanticipated Repair Work Procedures."

¹³ Defense Federal Acquisition Regulation Supplement 252.217-7028, "Over and Above Work," December 1991.

¹⁴ Level of effort is a specific amount of work performed before additional funding must be added to the contract.

Figure 2. Over and Above Repairs Review Process for Standard Repairs

Source: DoD OIG.

According to the JSTARS PMO, 116th Air Control Wing, and DCMA officials, the JSTARS program lacked the necessary onsite Government engineering support at the LCMMC to effectively validate if the proposed work scope, such as replace or repair decisions, was appropriate.

The Senior Center Contracting Official at Robins Air Force Base should direct the contracting officer to revise the Total System Support Responsibility contract clause to establish a procedure for the contracting officer to verify the appropriateness of all contractor-proposed over and above work before

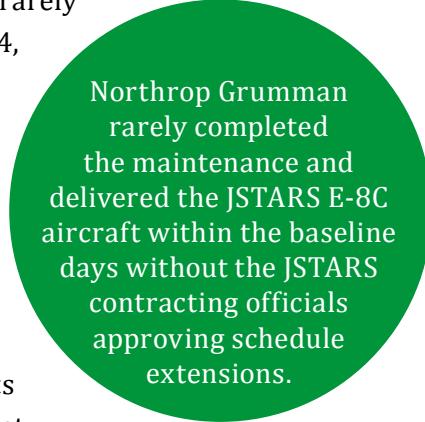
performance of the work, as required by the Defense Federal Acquisition Regulation Supplement 252.217-7028. Additionally, the Program Executive Officer for Battle Management should develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the Joint Surveillance Target Attack Radar System contracting officer in determining whether contractor-proposed over and above work for standard repairs is appropriate.

Effective Aircraft Availability Metric Was Not Established

(FOUO) The JSTARS contracting officer did not establish an aircraft availability metric requirement that was consistently achieved and satisfied the 116th and 461st Air Control Wings' need to have aircraft available for their mission. The contracting officer evaluated Northrop Grumman's performance of aircraft availability by the number of actual days above or below the scheduled depot maintenance days (baseline days¹⁵) agreed upon at the beginning of each contract performance period. The difference between actual days and scheduled days is known as the deviation in total aircraft possessed days (DAPDs). However, maintenance was rarely completed within the baseline days, and the metric did not relate to the user's desired outcome to have █ of 16 JSTARS E-8C aircraft available, making the aircraft availability metric requirement meaningless.

Maintenance Was Rarely Completed Within Baseline Days

The originally established number of baseline days was rarely achieved. For example in TSSR contract option period 14, Northrop Grumman met the original baseline days for only one of the six aircraft that were returned to the Air Force. Northrop Grumman rarely completed the maintenance and delivered the JSTARS E-8C aircraft within the baseline days without the JSTARS contracting officials approving schedule extensions and increasing the baseline days. The Defense Acquisition Guidebook¹⁶ states that sustainment metric requirements must be obtainable. Additionally, the guidance states that unrealistic requirements adversely affect the development process, result in unachievable performance levels, and drive higher acquisition and sustainment costs.



Northrop Grumman rarely completed the maintenance and delivered the JSTARS E-8C aircraft within the baseline days without the JSTARS contracting officials approving schedule extensions.

¹⁵ Baseline days refer to the number of maintenance days estimated before inspection, which are identified in the TSSR contract.

¹⁶ Defense Acquisition Guidebook, Chapter 5, "Life-Cycle Logistics," September 16, 2013.

(FOUO) During TSSR contract option periods 11.5 to 15, aircraft were delivered 32 times for scheduled depot maintenance. Because the E-8C JSTARS fleet consists of 16 aircraft, this meant that some aircraft were delivered for maintenance multiple times during these contract option periods.

(FOUO)
During TSSR contract option periods 11.5 to 15, the average number of days that the modified delivery dates exceeded the original delivery date ranged from [REDACTED]
[REDACTED]

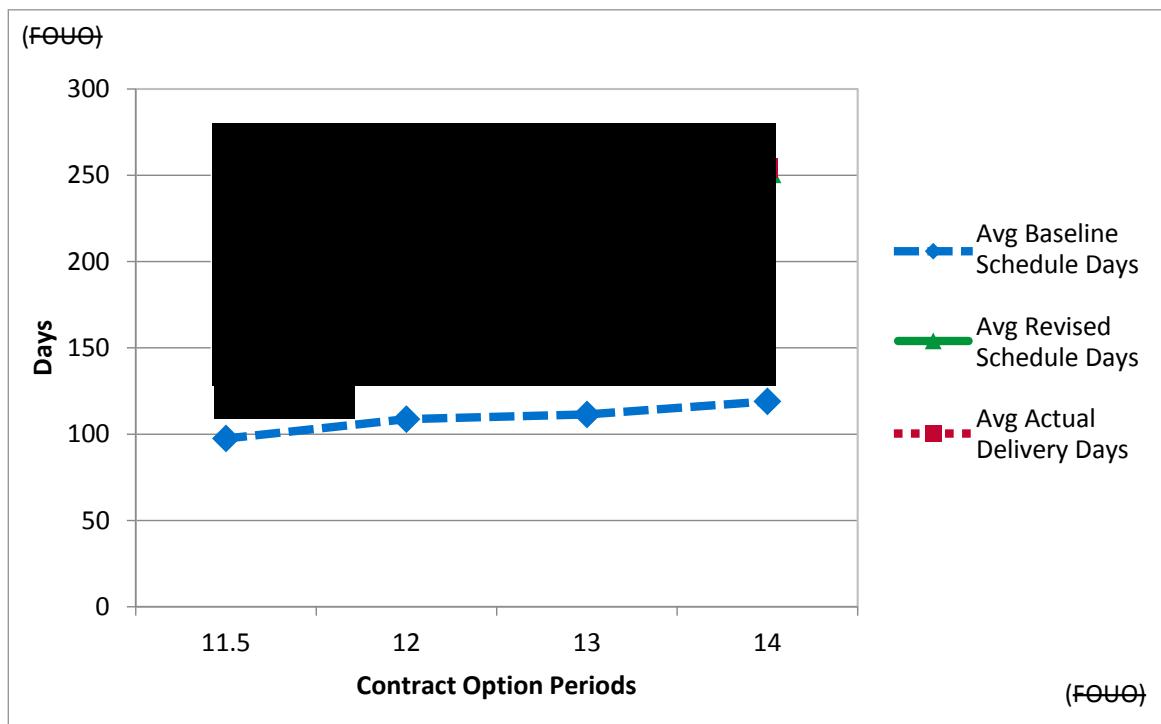
Additionally, the JSTARS contracting officials granted schedule extensions for 30 of the 32 scheduled depot maintenance repairs. During TSSR contract option periods 11.5 to 15, the average number of days that the modified delivery dates exceeded the original delivery date ranged from [REDACTED]. According to the TSSR contract and award fee plan, the JSTARS contracting officials may approve schedule extensions requested by the contractor, which increases the baseline days. For example, during contract option period 14,

Aircraft 97-0200 had 119 baseline days and Northrop Grumman delivered the aircraft from maintenance in [REDACTED]; the resulting DAPD of [REDACTED] would be rated as unsatisfactory contractor performance. However, when the JSTARS contracting officials approved Northrop Grumman's request to extend the schedule maintenance days to 244 days, the recalculated DAPD was [REDACTED]. For this example, according to the award fee plan, Northrop Grumman's performance was rated as excellent. The excellent performance rating made Northrop Grumman eligible to earn more award fee.

(FOUO) When the JSTARS contracting officials approved schedule extensions and modified the contract to revise the original baseline days during TSSR contract option periods 11.5 to 14,¹⁷ Northrop Grumman was able to deliver aircraft within an acceptable range of the revised baseline days on average. For example, in contract option period 14, Northrop Grumman delivered aircraft in an average of [REDACTED]. The originally established average baseline was 119 days, which would have resulted in an unsatisfactory performance of [REDACTED] after the originally established baseline. However, the JSTARS contracting officials approved schedule extensions that revised the average baseline to [REDACTED], which resulted in an excellent performance of 3 days after the revised baseline. Figure 3 shows Northrop Grumman's average actual delivery days compared to the average original and revised baseline days for TSSR contract option periods 11.5 to 14.

¹⁷ (FOUO) We did not include TSSR contract option period 15 in the analysis because only one of seven aircraft in scheduled depot maintenance had been delivered as of March 4, 2016.

Figure 3. Northrop Grumman's Average Performance in Delivering Aircraft for TSSR Contract Option Periods 11.5 to 14

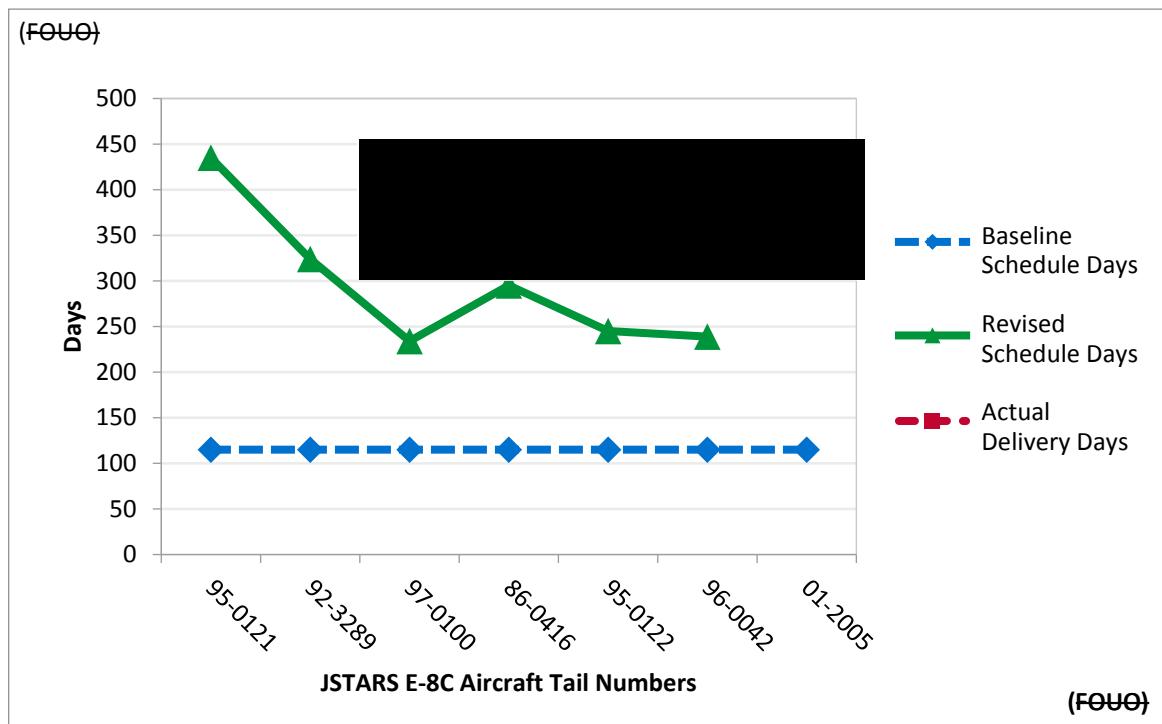


Note: Average days were used because more than one aircraft was in scheduled depot maintenance during a given contract option period.

Source: DoD OIG.

(FOUO) For TSSR contract option period 15, the JSTARS contracting officials approved schedule extensions for six of seven aircraft. However, Northrop Grumman has not completed maintenance or delivered any of the seven aircraft within the original baseline days or revised baseline days. As of March 4, 2016, six of seven aircraft were undergoing maintenance and had not been delivered. See Figure 4 for an illustration of Northrop Grumman's actual delivery days compared to the original and revised baseline days.

Figure 4. Northrop Grumman's Performance in Delivering Aircraft for TSSR Contract Option Period 15 (as of March 4, 2016)



Note: (FOUO) Only JSTARS aircraft 86-0416 was delivered during contract option period 15.

Source: DoD OIG.

Availability Metric Needs to Relate to User's Desired Outcomes

Contractor performance on the TSSR contract was not measured against the Air Control Wing user's desired outcome. PBL guidance¹⁸ states that PBL arrangements are tied to warfighter outcomes and integrate the various product support activities of the supply chain with appropriate incentives and metrics. One of the principles of PBL is to use measurable and manageable metrics that accurately assess the product support provider's performance against warfighter defined needs. Additionally, the PBL Guidebook states that one of the most important considerations for selecting metrics is to understand how they link and contribute to performance outcomes.

(FOUO) According to the Air Control Wing user, the desired outcome was that █ of 16 E-8C aircraft be available for training and missions at all times, with no more than █ aircraft in scheduled depot maintenance at any given time. However, as discussed previously, aircraft availability was measured based on the number of actual days above or below baseline days, which the contracting

¹⁸ "Performance Based Logistics Guidebook: A Guide to Developing Performance-Based Arrangements," Section 1.1, "PBL-Defined," May 27, 2014.

(FOUO) officials consistently revised through schedule extension approvals and contract modifications. Due to contractor-proposed over and above work and JSTARS contracting officials-approved schedule extensions, the number of aircraft in scheduled depot maintenance on average increased monthly during TSSR contract option periods 11.5 to 15. In TSSR contract option period 15, the 116th and 461st Air Control Wings performed monthly missions and training with 11 of 16 E-8C aircraft because Northrop Grumman had a monthly average of 5 aircraft in scheduled depot maintenance. In October of TSSR contract option period 15, the Air Control Wings had only nine available aircraft, because seven aircraft were in scheduled depot maintenance. See Appendix B for details on the number of aircraft in scheduled depot maintenance per month for TSSR contract option periods 11.5 to 15. According to an Air Control Wing official, the number of aircraft in scheduled depot maintenance increased to as many as eight during TSSR contract option period 16.

The Program Executive Officer for Battle Management should direct the JSTARS program manager, with support from the contracting officer, to revise the sustainment metric requirement on the follow-on contract for Total System Support Responsibility contract option period 17 to link the aircraft availability metric requirement to the Air Control Wing user's desired outcome for aircraft availability in accordance with the Performance-Based Logistics Guidebook.

Cost Performance Incentive Needs Improvement

(FOUO) The JSTARS contracting officer did not establish a performance incentive that adequately motivated the contractor to reduce cost and that discouraged contractor inefficiency and waste, as required by the Federal Acquisition Regulation (FAR).¹⁹ The FAR states that incentive contracts are designed to obtain specific acquisition objectives by including appropriate incentive arrangements designed to motivate contractor efforts that might not otherwise be emphasized and discourage contractor inefficiency and waste. The JSTARS contracting officer established performance incentives to achieve improved cost-performance-to-contract-estimate requirements. According to the TSSR award fee plan, the cost performance incentive was intended to encourage the contractor to manage authorized work within the authorized funding and to identify potential cost underruns. The contracting officer measured cost-performance-to-contract-estimate every 6 months by dividing the contractor's estimate at completion (EAC)²⁰ by the negotiated contract estimate for the annual performance period.

¹⁹ FAR Part 16, "Types of Contracts," Subpart 16.4, "Incentive Contracts," 16.401(a)(2)(ii).

²⁰ (FOUO) The estimate at completion is a calculation of incurred cost at contract completion based on actual costs incurred at the time of reporting. The estimate at completion is reported by Northrop Grumman's financial system.

(FOUO) In TSSR contract option period 16, the JSTARS contracting officer made 22 percent of the total award fee available for contractor cost performance. The contracting officer established an incentive metric, which pays the contractor 40 to 70 percent of the available award fee, when the EAC exceeded the contract cost estimate by 101 to 104 percent. See Table 2 for the award fee criteria for cost-performance-to-contract-estimate in TSSR contract option period 16.

Table 2. Cost-Performance-to-Contract-Estimate Metric for TSSR Contract Option Period 16

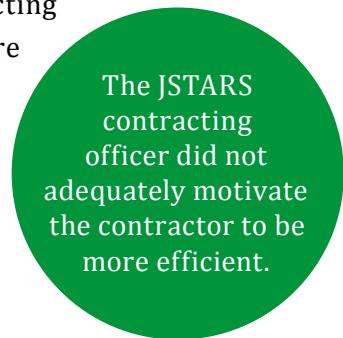
(FOUO) Cost-Performance-to-Contract Estimate (Percent)	Award Fee for Cost Performance Portion (Percent)	Performance Rating
97 or below	100	Excellent
98	95	Excellent
99	90	Very Good
100	80	Very Good
101	70	Good
102	60	Good
103	50	Satisfactory
104	40	Satisfactory (FOUO)

Note: (FOUO) The Air Force and Northrop Grumman agreed that 22 percent of the total award fee pool would be available for satisfactory to excellent cost performance. The column percentages apply to the cost performance portion of the total award fee pool.

Source: "E-8 (Joint STARS) Total System Support Responsibility Contract Award Fee Plan," November 1, 2015 (contract option period 16).

(FOUO) Based on past cost performance, the JSTARS contracting officer did not adequately motivate the contractor to be more efficient by allowing the contractor to earn award fee for EAC ranging from 101 to 104 percent of the contract cost estimate. During previous TSSR award fee evaluation periods 11-1 to 15-2,²¹ Northrop Grumman's EAC ranged from [REDACTED] of the contract cost estimate.

See Table 3 for Northrop Grumman's past cost-performance-to-contract-estimate.



The JSTARS contracting officer did not adequately motivate the contractor to be more efficient.

²¹ (FOUO) The JSTARS contracting officer evaluated cost performance-to-contract estimates every 6 months and the evaluation period identified which 6-month period was being evaluated. For example TSSR award fee evaluation period 15-1 represented the first 6 months of the year and period 15-2 represented the remaining 6 months.

Table 3. Northrop Grumman's Actual Cost-Performance-to-Contract-Estimate (TSSR Award Fee Evaluation Periods 11-1 through 15-2)

(FOUO) Award Fee Evaluation Period	Cost-Performance-to-Contract Estimate (Percent)	Performance Rating
11-1	[REDACTED]	Excellent
11-2	[REDACTED]	Excellent
12-1	[REDACTED]	Excellent
12-2	[REDACTED]	Excellent
13-1	[REDACTED]	Excellent
13-2	[REDACTED]	Excellent
14-1	[REDACTED]	Excellent
14-2	[REDACTED]	Excellent
15-1	[REDACTED]	Excellent
15-2	[REDACTED]	Excellent

Source: DoD OIG.

Based on Northrop Grumman's past performance, the contracting officer should have established a metric that would encourage the contractor to continue or exceed its level of performance exhibited during TSSR award fee evaluation periods 11-1 through 15-2. The Senior Center Contracting Official, Robins Air Force Base, should direct the JSTARS contracting officer to establish evaluation criteria in the award-fee plan for TSSR contract option period 17 that adequately motivate Northrop Grumman to reduce cost and discourage inefficiency in accordance with FAR 16.401(a)(2)(ii).

Management of Award Fee Portions Was Inadequate

(FOUO) The JSTARS contracting officer did not properly manage portions of the award fee allocated for aircraft availability and cost performance requirements, which resulted in Northrop Grumman receiving award fees of \$7.6 million in TSSR contract periods 14 and 15 that could have been realized as Air Force cost savings. In TSSR contract option periods 14 and 15, the contracting officer set specific guidelines, which allowed the contractor to earn more than 100 percent of the available award fee for excellent performance by realigning unexpended funds from other contract line items to the award fee contract line

(FOUO) The contracting officer set specific guidelines, which allowed the contractor to earn more than 100 percent of the available award fee.

(FOUO) item. The contracting officer's actions to transfer cost underruns into contractor award fees undermine the Air Force's goal of realizing savings. Furthermore, the contracting officer did not comply with the FAR²² and Air Force Award Fee guidance,²³ which state that the maximum award fee available for contractor performance is 100 percent.

(FOUO) In TSSR contract option periods 14 and 15, the contracting officer offered award fees totaling \$12.7 million and \$8.5 million, respectively, to Northrop Grumman if aircraft were successfully delivered from maintenance within specified periods of the baseline days. According to the award fee plans, Northrop Grumman could earn 102 to 162 percent of the available award fee allocated to aircraft availability when the contractor delivered aircraft within 1 to 25 days before the scheduled delivery date. See Table 4 for details on the award fee criteria for excellent aircraft availability performance in TSSR contract option periods 14 and 15.

Table 4. TSSR Contract Option Periods 14 and 15 Award Fee Criteria for Excellent Aircraft Availability Performance

(FOUO) Award Fee for Aircraft Availability Performance Portion (Percent)	Deviation in Total Aircraft Possessed Days	Performance Rating
132-162	13-25	Excellent
117-130	7-12	Excellent
107-115	3-6	Excellent
102-105	1-2	Excellent (FOUO)

Note: (FOUO) The Air Force and Northrop Grumman agreed that 45 percent of the total award fee pool would be allocated for satisfactory to excellent aircraft availability performance in contract option period 14 and 40 percent in contract option period 15. The column percentages apply to the availability performance portion of the total award fee pool.

Source: "E-8 (Joint STARS) Total System Support Responsibility Contract Award Fee Plan," November 1, 2013 (contract option period 14), and November 1, 2014 (contract option period 15).

(FOUO) Additionally, in TSSR contract option periods 14 and 15, the contracting officer offered award fees totaling \$12.7 million and \$6.4 million, respectively, to Northrop Grumman if the EAC was within specified percentages of the contract cost estimate. According to the award fee plans, Northrop Grumman could earn 110 to 162 percent of the available award fee allocated to cost performance when

²² FAR 16.401(e)(3)(iv).

²³ Department of the Air Force Award Fee Guide, August 13, 2010, Section 3.1.4, "Additional Considerations."

(FOUO) the contractor's EAC was within 89 to 95 percent of the contract cost estimate. See Table 5 for details on the award fee criteria for cost performance in TSSR contract option periods 14 and 15.

Table 5. Award Fee Criteria for Excellent Cost-Performance-to-Contract-Estimate (TSSR Contract Option Periods 14 and 15)

(FOUO) Cost-Performance-to-Contract Estimate (Percent)	Award Fee for Cost Performance Portion (Percent)	Performance Rating
89	162	Excellent
90	160	Excellent
91	150	Excellent
92	140	Excellent
93	130	Excellent
94	120	Excellent
95	110	Excellent (FOUO)

Note: (FOUO) The Air Force and Northrop Grumman agreed that 45 percent of the total award fee pool would be available for satisfactory to excellent cost performance in contract option period 14 and 30 percent in contract option period 15. The column percentages apply to the cost performance portion of the total award fee pool.

Source: "E-8 (Joint STARS) Total System Support Responsibility Contract Award Fee Plan," November 1, 2013 (contract option period 14), and November 1, 2014 (contract option period 15).

(FOUO) In TSSR contract option period 16, the JSTARS contracting officer took corrective action and capped the available award fee pool allocated for cost performance and aircraft availability at 100 percent for an excellent performance rating. However, during TSSR contract option periods 14 and 15, the JSTARS contracting officer mismanaged the award fee pool, which resulted in the Air Force paying award fees, totaling \$7.6 million to Northrop Grumman when it could have been realized as Air Force cost savings on the TSSR contract or put to better use. Therefore, the contracting officer should seek recovery of the award fee payments through all available contractual remedies. Appendix C shows the unallowable award fees paid in contract options periods 14 and 15.



The JSTARS contracting officer mismanaged the award fee pool, which resulted in the Air Force paying award fees, totaling \$7.6 million to Northrop Grumman.

A TSSR contract clause, “Procedures for Disputes Resolution by Alternate Disputes Resolution Process,” establishes procedures for resolving any issue, disagreement, or dispute due to an interpretation of the TSSR contract, or stemming from the operation of the award fee plan, award term plan, or partnering agreement, or becomes part of the contract with the scope of individual orders. The Air Force and Northrop Grumman agreed to use the dispute resolution process before initiating any formal judicial or other dispute resolution process. However, according to the Defense Acquisition Regulation Supplement, Procedure, Guidance, and Information,²⁴ if legal counsel determines that contractual remedies are not readily available, the contracting officer may solicit voluntary refunds when the contractor’s retention of the amount in question would be contrary to good conscience and equity.

Therefore, the Senior Center Contracting Official, Robins Air Force Base, should direct the JSTARS contracting officer to determine if the unallowable award fees paid during TSSR contract option periods 14 and 15, totaling \$7.6 million, can be recovered through the “Procedures for Disputes Resolution By Alternate Disputes Resolution Process” clause in the TSSR contract. If a contractual remedy is not available, the contracting officer should seek a voluntary refund in accordance with Defense Federal Regulation Supplement, Procedure, Guidance, and Information 242.71. Additionally, the Senior Center Contracting Official, Robins Air Force Base, should direct the JSTARS contracting officer to conduct periodic reviews of the JSTARS TSSR contract to ensure its compliance with the FAR and Air Force guidance.

Sustainment Strategy for an Aging Fleet Needs Analysis

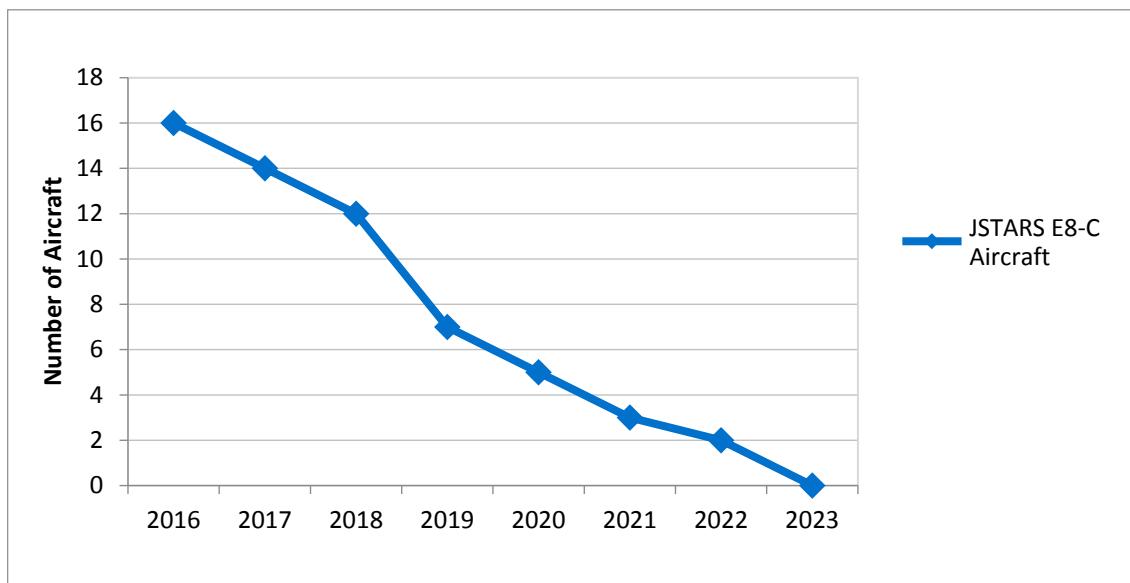
The JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or to use another platform for JSTARS. The Air Force performed a business case analysis in March 2007 to determine whether the cost-plus-award-fee TSSR contract was delivering the performance-based logistics goals of increased readiness and reduced-life-cycle cost and inventory. However, the business case analysis did not include an alternative airframe study to evaluate whether sustaining the pre-owned and aging E-8C fleet was the most cost-effective option. The alternative airframe study should consider the remaining aircraft service life, over and above repair cost growth, and the full production schedule of the replacement Next-Generation JSTARS Recapitalization Program, an upgrade to the legacy JSTARS program.

²⁴ Defense Federal Acquisition Regulation Supplement, Procedure, Guidance and Information, 242.7100(2)(i), “Voluntary Refunds.”

E-8C Aircraft Service Life Degrades as Repair Costs Increase

As the E-8C fleet's service life diminishes, the over and above repair costs have significantly increased. As of August 2015, the average age of the E-8C airframe was 47 years. According to the JSTARS PMO, the E-8C aircraft leads Air Force-wide fleets in hours flown with 58,000 hours. Additionally, according to the 116th Air Control Wing Vice Commander, the fleet has a diminishing service life that would leave the Wing with only two aircraft fit to fly by the end of the TSSR contract performance period in 2022. See Figure 5 for the estimated diminishing service life of the JSTARS aircraft.

Figure 5. E-8C JSTARS Aircraft Remaining Service Life



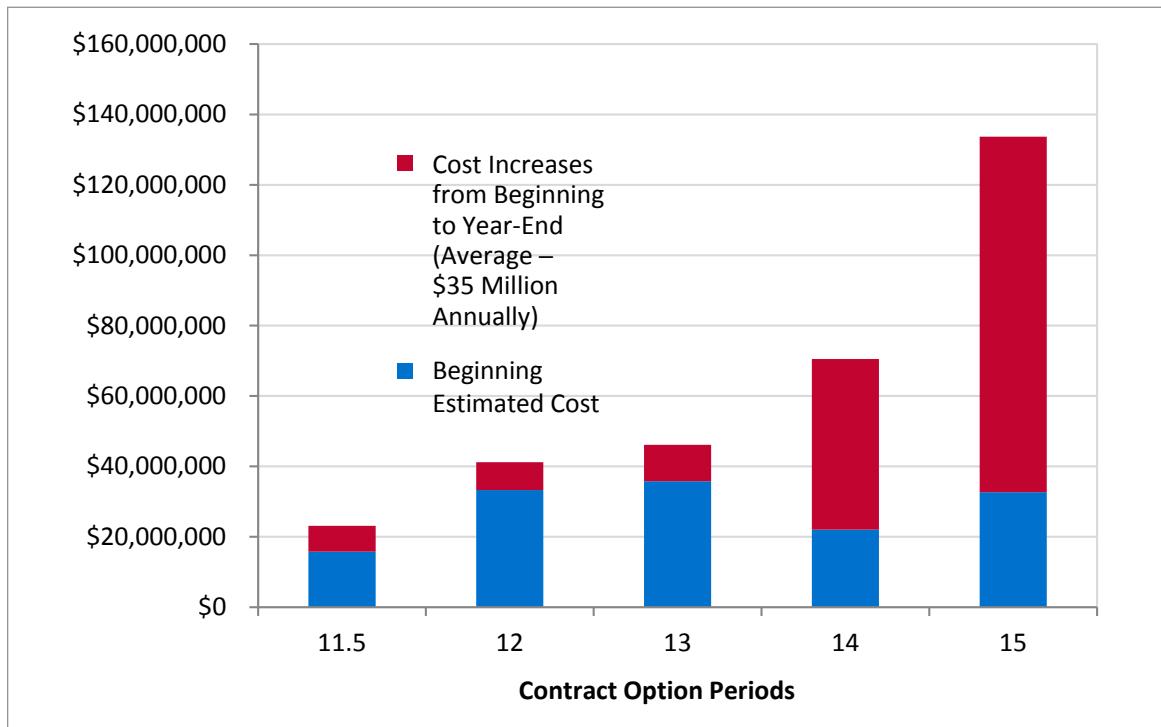
Source: DoD OIG.

{FOUO} For E-8A JSTARS Aircraft 86-0416, used for training, the PEO for Battle Management accepted serious flight risks and returned the aircraft to service on two occasions. In November 2010, the aircraft reached the E-8C design goal and certified service life of 20,000 flight hours, but the PEO returned the aircraft to service based on Technical Airworthiness Authority engineer review results. Specifically, in February 2014, Aircraft 86-0416 was grounded because its flight hours were approaching the high-risk threshold of 125 percent of the 20,000-hour certified service life. And in December 2015, the PEO accepted the risk as serious and again returned the aircraft to service.

Additionally, the over and above repair costs from the beginning of each TSSR period of performance to the end of TSSR contract option periods 11.5 to 15 have increased an average of \$35 million annually. An alternative airframe study would help to determine whether it is cost-effective to continue to sustain the aging fleet of E-8C aircraft or to use another platform to support the JSTARS. See Figure 6 for over and above cost increases for TSSR contract option periods 11.5 to 15.

The over and above repair costs . . . have increased an average of \$35 million annually.

Figure 6. Over and Above Cost Growth for TSSR Contract Option Periods 11.5 to 15



Source: DoD OIG.

Solution Needed Until Next-Generation JSTARS Recapitalization Program Production

When selecting an alternative airframe to support the current JSTARS, the JSTARS program manager needs to make sure that the airframe can support JSTARS mission until the Next Generation JSTARS Recapitalization Program reaches full production. According to a House of Representatives committee report,²⁵ Congress is aware of the need to replace the current E-8C JSTARS aircraft due to problematic low availability rates, end of service life issues, and increasing

²⁵ House of Representatives Report 114-102, "National Defense Authorization Act for Fiscal Year 2016: Report of the Committee on Armed Services House of Representatives," May 5, 2015.

sustainment cost. However, the Next Generation JSTARS is in the early stages of research and development and full operational capability is scheduled for several years after 2023. Moreover, Public Law 114-92²⁶ prohibits the Air Force from using fiscal years 2016 and 2017 appropriated funds to retire the E-8C JSTARS aircraft, unless the Secretary of the Air Force determines, on a case-by-case basis, that an individual aircraft is not operational because of mishaps, or other damage, or is uneconomical to repair. Based on the aircraft ages, service life degradation, and growing over and above repair costs, exceptions to retirement are likely to apply. The current JSTARS operational requirements may need an alternative supporting platform until the Next Generation JSTARS Recapitalization Program is in full production.

The Program Executive Officer for Battle Management should direct the Joint Surveillance Target Attack Radar System program manager to perform a service-life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate operational capability risks until the Next Generation Joint Surveillance Target Attack Radar System Recapitalization Program achieves full production.

Conclusion

As a result of the acquisition decision to refurbish pre-owned Boeing 707-300C aircraft with limited maintenance history into E-8C JSTARS aircraft, the JSTARS PMO is faced with significant challenges to maximizing aircraft availability and reducing cost. However, the following management actions to reduce costs are within the control of the JSTARS contracting officer and program manager:

- establishing adequate oversight procedures for over and above repairs;
- establishing cost performance incentives; and
- performing an alternative airframe study to identify the most cost-effective airframe platform to support the JSTARS.

Additionally, as the user, the Air Control Wings' mission requirements must be supported by effective program management and contracting. Specifically, the JSTARS contracting officer must develop a consistently achievable aircraft availability metric requirement to measure the contractor's effectiveness in supporting mission requirements. Without these management actions, the JSTARS PMO will continue to pay Northrop Grumman reimbursable expenses and award fees, which have totaled \$1.1 billion for TSSR contract option periods 11.5 to 15, without receiving the contract deliverables.

²⁶ Public Law 114-92, "National Defense Authorization Act for Fiscal Year 2016," November 25, 2015.

Recommendations, Management Comments, and Our Response

Revised Recommendation

As a result of management comments, we revised draft Recommendation 2.b to recommend that a life cycle study be performed to determine cost-effective options to sustain the aging E-8C fleet to mitigate operational capability risks. According to the Chief, C2ISR Division, the original recommendation to perform an alternative airframe study would require too much time and would not be cost-effective. Specifically, the Chief stated that the extensive re-engineering, modification, and testing efforts required for an alternative airframe study would take as much time as the engineering, manufacturing, and development phase for the Next Generation JSTARS Recapitalization Program. Additionally, according to the Chief, the process to obtain funding for an alternative airframe would be too time-consuming. The Chief stated that the Next Generation JSTARS Recapitalization Program would be approaching full operating capability by the time funding was secured for an alternative airframe. Furthermore, the Chief stated that the required developmental and procurement funding for an alternative airframe would deplete resources needed for the Next Generation JSTARS Recapitalization Program.

Recommendation 1

We recommend that the Senior Center Contracting Official, Robins Air Force Base, require the contracting officer to:

- a. **Revise the Total System Support Responsibility contract clause to establish a procedure for the contracting officer to verify the appropriateness of all contractor-proposed over and above work before performance of the work as required by the Defense Federal Acquisition Regulation Supplement 252.217-7028.**

Department of the Air Force Comments

The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that he would approve all corrective actions implemented and certified by the C2ISR Division Chief.

The PEO for Battle Management stated that the purpose of the TSSR contract was for the contractor to have depot-level responsibility for JSTARS according to the terms of the contract. Specifically, the PEO stated that the contractor would be

responsible for daily management, direction, and control of program activities and resources. The PEO stated that, although language from the Defense Federal Acquisition Regulation Supplement 252.217-7028 was not included in the contract, the Air Force developed special clause H-953 to define the required repair work procedures, negotiated rates, and factors for repairs identified during maintenance. Additionally, the PEO stated that the contracting officer would request more DCMA oversight to refine the review process for the unanticipated repairs requested by Northrop Grumman for TSSR contract option period 17. The PEO stated that the Air Force would request the DCMA to review the appropriateness of the requested work, proposed hours, and bill of material. Furthermore, the PEO stated that the contracting officer would revise special clause H-953 to reflect the revised review procedures by October 31, 2016.

Our Response

Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

- b. Establish evaluation criteria in the award-fee plan for Total System Support Responsibility contract option period 17 that adequately motivate Northrop Grumman to reduce cost and that discourage inefficiency, in accordance with Federal Acquisition Regulation 16.401(a)(2)(ii).**

Department of the Air Force Comments

The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that the contracting officer does not develop the award fee plan or determine the fee, but the contracting officer is a member of the award fee review board. Additionally, the PEO stated that the fee-determining official approves the award fee plan and decides the award fee. The PEO stated that the C2ISR Division will make significant changes, including cost metric revisions, to the award fee plan for TSSR contract option year 17 by October 31, 2016.

Our Response

Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

- c. Determine if the unallowable award fees paid during Total System Support Responsibility contract option periods 14 and 15, totaling \$7.6 million, can be recovered through either the “Procedures for Disputes Resolution by Alternate Disputes Resolution Process” clause in the Total System Support Responsibility contract or voluntary refund in accordance with Defense Federal Regulation Supplement, Procedure, Guidance, and Information 242.71.

Department of the Air Force Comments

(FOUO) The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that the program office attempted to incentivize the contractor to repair the aircraft at a faster rate and reduce cost during 2014 and 2015. Additionally, the PEO stated that the fee determining official allowed more than 100 percent of the award fee to be earned based on the terms of the award fee plan. The PEO stated that the JSTARS contracting officer would consult with legal counsel to determine if requesting the recovery of \$7.6 million is appropriate and achievable through the disputes clause in the TSSR contract or Defense Federal Acquisition Regulation Supplement, Procedure, Guidance, and Information 242.7100. The PEO gave an estimated completion date of September 15, 2017.

Our Response

Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

- d. Conduct periodic reviews of the Joint Surveillance Target Attack Radar System Total System Support Responsibility contract to ensure its compliance with the Federal Acquisition Regulation and Air Force guidance.

Department of the Air Force Comments

The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that the contracting officer would make sure that the TSSR contract complies with FAR and Air Force guidance. The PEO stated that terms and conditions included in the contract at the time of award remain in effect unless a statute or regulation requires a change. The PEO stated that annual task orders under the TSSR contract are subject to business and contract approval

requirements in accordance with Air Force Federal Acquisition Regulation Supplement 5301.90(a)(7). According to the PEO, the objectives of the contract approval process are to make sure that:

- contract actions effectively implement approved acquisition strategies;
- negotiations and contract actions result in fair and reasonable business arrangements;
- negotiations and contract actions are consistent with laws, regulations, and policies; and
- an independent review and assessment for the proposed contract action is accomplished.

The PEO stated that prior to task order issuance, legal and contract policy reviews are conducted to ensure compliance with FAR and Air Force guidance.

Our Response

Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

Recommendation 2

We recommend that the Program Executive Officer for Battle Management:

- a. **Develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the Joint Surveillance Target Attack Radar System contracting officer in determining whether contractor-proposed over and above work is appropriate.**

Department of the Air Force Comments

(FOUO) The PEO for Battle Management agreed with the recommendation. The PEO stated that the contractor was in total control of airframe maintenance, including appropriate over and above work, with minimal Government oversight. The PEO stated that as a result, the program office was not staffed to provide onsite depot technical support. The PEO stated that the C2ISR Division has requested additional DCMA and program office manpower to provide on-site depot technical support. Since December 2015, the program office has increased temporary duty visits to the depot. Additionally, the PEO stated that the program office added in-depth reviews of aircraft undergoing maintenance. The PEO stated that Government engineers have supported major milestone events such as the E-8 corrosion survey, fuels symposium, and aircraft gate reviews.

Our Response

Comments from the PEO for Battle Management addressed the specifics of the recommendation, and no further action is required.

- b. Direct the program manager for the Joint Surveillance Target Attack Radar System to perform a service-life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate operational capability risks until the Next Generation Joint Surveillance Target Attack Radar System Recapitalization Program achieves full production.**

Department of the Air Force Comments

(FOUO) The PEO for Battle Management agreed with the recommendation. The PEO stated that the fuselage is one of the primary service-life limiting structures on the E-8C aircraft. Additionally, the PEO stated that widespread fatigue damage of the fuselage is a concern due to the age of the E-8C aircraft. The PEO stated that in February 2016, the C2ISR Division asked Boeing to perform a widespread fatigue damage study on sections of the fuselage. The study is scheduled to be completed by March 2017. The PEO stated that the C2ISR Division will use the results of the study to determine the requirements to extend the E-8C service life. The PEO stated that the determination would include funding requirements and schedules to keep the fleet operational during service-life extension activities. The PEO gave an estimated completion date of May 1, 2017.

Our Response

Comments from the PEO for Battle Management addressed the specifics of the recommendation, and no further action is required.

Recommendation 3

We recommend that the Program Executive Officer for Battle Management direct the Joint Surveillance Target Attack Radar System program manager, with support from the Joint Surveillance Target Attack Radar System contracting officer, to revise the sustainment metric requirement on the follow-on contract for Total System Support Responsibility contract option period 17 to link the aircraft availability metric requirement to the Air Control Wing user's desired outcome for aircraft availability in accordance with the Performance Based Logistics Guidebook.

Department of the Air Force Comments

(FOUO) The PEO for Battle Management agreed, stating that the C2ISR Division has proposed changing TSSR contract option period 17 aircraft availability award fee criteria from a DAPD to a work-in-progress metric. The PEO stated the change to a work-in-progress metric will directly relate Northrop Grumman's award fee to the user's requirement for three aircraft in depot. According to the PEO, the work-in-progress metric will be the heaviest weighted award fee evaluation factor at 75 percent. The PEO stated that the award fee criteria for TSSR contract option period 17 will be implemented by October 31, 2016.

Our Response

Comments from the PEO for Battle Management addressed all the specifics of the recommendation, and no further action is required.

Appendix A

Scope and Methodology

We conducted this performance audit from September 2015 through October 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Interviews and Documentation

To determine whether the Air Force was efficient on the TSSR contract to support the JSTARS program, we met with officials from:

- JSTARS Branch of the Battle Management Directorate within the Air Force Life Cycle Management Command at Robins Air Force Base;
- 116th and 461st Air Control Wings at Robins Air Force Base;
- DCMA, Aircraft Integrated Maintenance Operations at Lake Charles, Louisiana; and
- Northrop Grumman Systems Corporation, Northrop Grumman Aerospace Systems at Robins Air Force Base and Lake Charles, Louisiana.

We reviewed the TSSR contract and related modifications dated from September 2000 to December 2015. We also reviewed award fee plans; award fee determinations briefings; documents related to the scheduled maintenance days and actual days; inspection assessment briefing and letter; DCMA manufacturing and production surveillance plan; and DCMA reviews of additional funding requests for unanticipated repairs and schedule extensions. In addition, we reviewed the following guidance related to sustainment strategy, over and above repairs, metrics, and award fee:

- Public Law 114-92;
- Federal Acquisition Regulation 16.401;
- Defense Federal Acquisition Regulation Supplement 242.71 and 252.217-7028;
- Defense Acquisition Guidebook;
- Performance Based Logistics Guidebook;
- Air Force Instruction 63-101/20-101; and
- Department of the Air Force Award-Fee Guide.

Use of Computer-Processed Data

We did not use computer-processed data to perform this audit.

Prior Coverage

During the last 5 years, the Government Accountability Office (GAO) and the Department of Defense Inspector General (DoD IG) issued five reports discussing JSTARS or performance metrics. Unrestricted GAO reports can be accessed at <http://www.gao.gov>. Unrestricted DoD IG reports can be accessed at <http://www.dodig.mil/pubs/index.cfm>.

GAO

Report No. GAO-12-558, "Defense Acquisitions: Further Action Needed to Improve DoD's Insight and Management of Long-Term Maintenance Contracts," May 31, 2012

The report recommended that DoD develop lessons learned for long-term maintenance contracts, including the JSTARS sustainment contract, regarding incentives and cost-control tools that the DoD could use.

DoD IG

Report No. DODIG-2015-052, "Air Force Life Cycle Management Center's Management of F119 Engine Spare Parts Needs Improvement," December 19, 2014

The report recommended that the Air Force Life Cycle Management Center review the metrics in the F119 engine sustainment contract to verify that the incentive fees were accurate as of 2010 and take appropriate action to correct any potential underpayments or overpayments.

Report No. DODIG-2014-119, "Excess Inventory Acquired on Performance-Based Logistics Contracts to Sustain the Air Force's C-130J Aircraft," September 22, 2014

The report recommended that the Tactical Airlift Division for the C-130J program establish and monitor an appropriate inventory control metric in the performance-based logistics contract for the sustainment of the C-130 Hercules aircraft.

Report No. DODIG-2012-102, "Better Cost-Control Measures Are Needed on the Army's Cost-Reimbursable Services Contract for Logistics Support of Stryker Vehicles," June 18, 2012

The report recommended that the Project Management Office for Stryker Brigade Combat Team establish and monitor appropriate cost and inventory control metrics if a performance-based logistics services contract is used for sustainment of the Stryker vehicles.

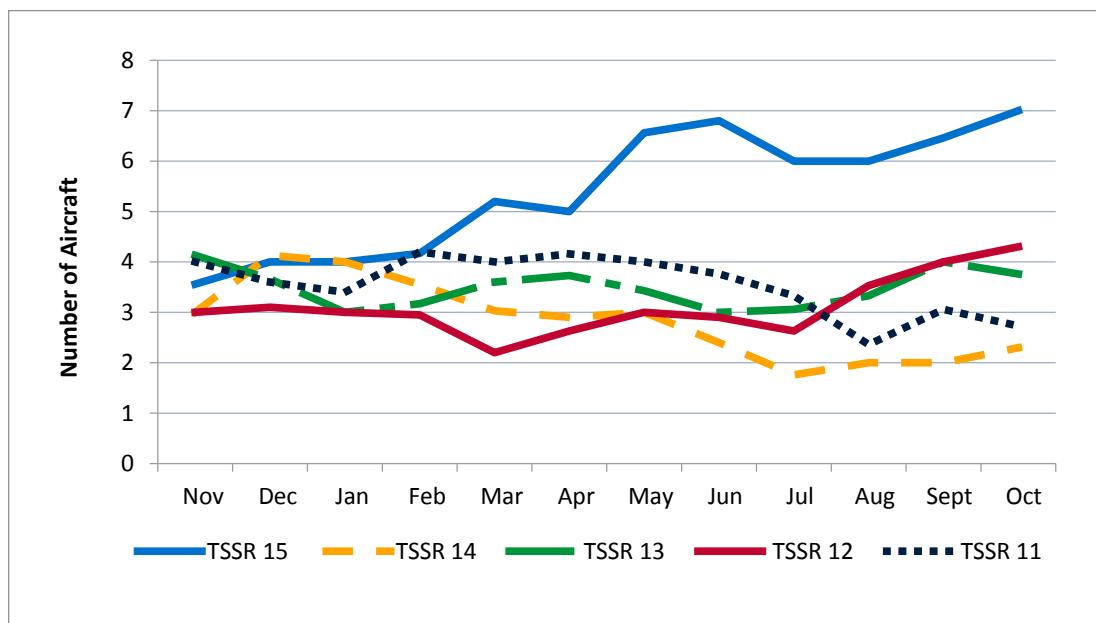
Report No. D-2011-061, "Excess Inventory and Contract Pricing Problems Jeopardize the Army Contract with Boeing to Support the Corpus Christi Army Depot,"
May 3, 2011

The report recommended that Army Aviation and Missile Life Cycle Management Command include appropriate metrics for eliminating excess DoD inventory if the contractor is responsible for managing the inventory.

Appendix B

Aircraft in Scheduled Depot Maintenance by Contract Year

(FOUO) According to the 116th Air Control Wing user, to ensure its required number of aircraft were available for training and missions, no more than [REDACTED] aircraft could be in scheduled depot maintenance at any given time. However, as shown in the figure, during several months, more than [REDACTED] aircraft were in scheduled depot maintenance from TSSR contract option periods 11.5 to 15.



Note: The source material stated TSSR 11 when it was actually TSSR contract option period 11.5.
Source: 116th Air Control Wing.

Appendix C

Unallowable Award Fees Paid in Contract Option Periods 14 and 15

The JSTARS contracting officer made unallowable award fee payments totaling \$7.6 million in TSSR contract option periods 14 and 15. The payments exceeded the maximum percentage of award fee allowed by the FAR²⁷ and Air Force Award Fee guidance.²⁸ The table shows the unallowable award fees paid in contract option periods 14 and 15.

(FOUO) TSSR Period	Aircraft Availability			Cost Performance-to-Contract Estimate			Total Unallowable Amount
	Allowable Amount	Amount Paid	Unallowable Payments	Allowable Amount	Amount Paid	Unallowable Payments	
14-1	\$4,942,921	\$241,654	\$0	\$4,942,921	\$6,425,797	\$1,482,876	\$1,482,876
14-2	7,731,867	8,487,872	756,005	7,731,867	10,824,614	3,092,747	3,848,752
Subtotal	\$12,674,788	\$8,729,526	\$756,005	\$12,674,788	\$17,250,411	\$4,575,623	\$5,331,628
15-1	4,243,705	4,116,394	0	3,182,779	4,137,612	954,834	954,834
15-2	4,283,659	3,726,783	0	3,212,744	4,497,842	1,285,098	1,285,098
Subtotal	\$8,527,364	\$7,843,177	0	\$6,395,523	\$8,635,454	\$2,239,931	\$2,239,931
Total			\$756,005			\$6,815,554	\$7,571,559
							(FOUO)

Note: Totals may not equal the actual sum due to rounding.

Source: DoD OIG.

²⁷ FAR 16.401(e)(3)(iv).

²⁸ Department of the Air Force Award Fee Guide, August 13, 2010, Section 3.1.4, "Additional Considerations."

Management Comments

Department of the Air Force Comments



DEPARTMENT OF THE AIR FORCE
AIR FORCE LIFE CYCLE MANAGEMENT CENTER
HANSCOM AIR FORCE BASE MASSACHUSETTS

20 September 2016

MEMORANDUM FOR HQ AF/FMP/AQ/AG
PENTAGON
WASHINGTON DC 20330-1130

FROM: AFPEO/BM
5 Eglin Street, Bldg 1624
Hanscom AFB MA 01731-2115

(U) SUBJECT: Management Comments, DoD-IG Draft Report of Audit (ROA), *The Air Force Needs to Improve Cost Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS)*, Project D2015-000AH-0263-000

(U) 1. AFPEO/BM concurs with the results and findings stipulated in the subject ROA.
Management comments and corrective actions are provided in the attachment.

(U) 2. Direct questions to [REDACTED] AFLCMC/HBGC, DSN [REDACTED]
[REDACTED] or the Battle Management (HB) Directorate AFP, [REDACTED]
[REDACTED] AFLCMC/HBF, Com [REDACTED]


STEVEN D. WERT, SES, DAF
Program Executive Officer for Battle Management

Department of the Air Force Comments (cont'd)



**DEPARTMENT OF THE AIR FORCE
AIR FORCE LIFE CYCLE MANAGEMENT CENTER
ROBINS AIR FORCE BASE GEORGIA**

SEP 20 2016

MEMORANDUM FOR AFPEO BATTLE MANAGEMENT
5 EGLIN ST
HANSCOM AFB MA 01731-2100

HQ AF/FMP/AQ/AG
PENTAGON
WASHINGTON DC 20330-1130

IN TURN

FROM: AFLCMC/HBG
235 Byron St, Suite 19A
Robins AFB GA 31098-1670

- (U) SUBJECT: Management Comments, DoD-IG Draft Report Of Audit (ROA), *The Air Force Needs to Improve Cost-effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS)*, Project D2015-000AH-0263.000.
- (U) 1. Management comments are submitted in collaboration with the Senior Center Contracting Official at Robins AFB, GA (AFSC/PK).
- (U) 2. We concur with the *results and findings* stipulated in subject ROA. Management comments and corrective actions appear in attachment.
- (U) 3. Report clarification: the draft ROA directs AFSC/PK to implement recommendation 1 and the AFPEO Battle Management (BM) at Hanscom AFB, MA, to implement recommendations 2 and 3. It is important to note that with the approval of AFPEO BM, all corrective actions will be implemented and certified by the C2ISR Division Chief (HBG) at Robins AFB, GA.
- (U) 4. Language for recommendation 2b was renegotiated with DoD-IG. Our response, consistent with the new language appears in Attachment 3, Management Comments.
- (U) 5. Direct questions to [REDACTED] AFLCMC/HBGC, DSN [REDACTED] COM [REDACTED]
[REDACTED] or the Battle Management (HB) Directorate AFP, [REDACTED]
AFLCMC/HBF, COM [REDACTED]

RAYMOND C. WIER III, Col, USAF
Senior Materiel Leader
C2ISR Division

Attachment:

1. Management Comments (4 pages)

cc:

HBG Division File Clerk
Battle Management Audit Focal Point (HBF)

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Department of the Air Force Comments (cont'd)

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DoD-IG

Report Of Audit (ROA)

C2ISR Division (AFLCMC/HBG)

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS), Project D2015-000AII-0263.000

MANAGEMENT COMMENTS

1. Recommendation 1: (U) We [DoD-IG] recommend that the Senior Center Contracting Official, Robins AFB, GA, require the [HBK] contracting officer to:

a. (U) Revise the Total System Support Responsibility (TSSR) contract clause to establish a procedure for the contracting officer to verify the appropriateness of all contractor-proposed over and above work before performance of the work as required by the Defense Federal Acquisition Regulation Supplement (DFARS) 252.217-7028.

1. (U) Concur with recommendation 1a.

2. OPEN.

3. (U) [Estimated Completion Date (ECD)]: 31 Oct 2016.

4a. (U) Background/History: The main purpose of TSSR was for the contractor to assume depot-level responsibility for the Joint Surveillance Target Attack Radar System (JSTARS) weapon system under the terms and conditions of the contract. The contractor would be directly responsible for the day to day management, direction, and control of program activities and resources. DFARS 252.217-7028, Over And Above was not used in the contract when awarded; however, a special clause "H-953 Depot Maintenance Unanticipated Repair Work" was developed to address required repair work found during programmed depot maintenance. All required policy and legal reviews commensurate with the contract dollar value were conducted and the contract was approved with the H-953 clause. H-953 defines the procedures to be followed and contains negotiated rates and factors for repairs that are conducted.

4b. (U) HBKAA will work with the Defense Contract Management Agency (DCMA) to refine the review process for the unanticipated repairs that are requested by Northrop Grumman (NG) for TSSR year 17. The TSSR program office is requesting more DCMA insight of the unanticipated repairs proposed by NG and the H-953 clause will be revised accordingly. DCMA will be requested to review the appropriateness of the requested work, proposed hours, and bill of material.

b. (U) Establish evaluation criteria in the award-fee plan for Total System Support Responsibility contract option period 17 that adequately motivate Northrop Grumman to reduce cost and that discourage inefficiency, in accordance with Federal Acquisition Regulation 16.401(a)(2)(ii).

1. (U) Concur with recommendation 1b.

2. OPEN.

3. (U) Estimated Completion Date (ECD): 31 Oct 2016.

20 September 2016

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Department of the Air Force Comments (cont'd)

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DoD-IG

Report Of Audit (ROA)

C2ISR Division (AFL.CMC/IIBG)

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS), Project D2015-000AH-0263.000

4a. (U) Background/history: The Award Fee Plan is not developed nor is the fee determined by the Contracting Officer, although the Contracting Officer does serve as a member of the negotiating team and the Award Fee Review Board. The Award Fee Plan is approved by the Fee Determining Official (FDO) and all subsequent fee decisions are ultimately made by the FDO, with the support of the Award Fee Review Board. The Award Fee Plan is evaluated periodically to determine if a revision is necessary to accomplish program goals.

4b. (U) IIBG will make changes to the TSSR year 17 Award Fee Plan, which will be significantly revised, to include cost metric revisions. The Award Fee Plan will be part of the TSSR Year 17 negotiations in October 2016.

c. (FOUO) Determine if the unallowable award fees paid during Total System Support Responsibility contract option periods 14 and 15, totaling \$7.6 million, can be recovered through either the "Procedures for Disputes Resolution by Alternate Disputes Resolution Process" clause in the Total System Support Responsibility contract or voluntary refund in accordance with Defense Federal Regulation Supplement, Procedure, Guidance, and Information 242.71.

1. (U) Concur with recommendation 1c.

2. (U) OPEN.

3. (U) Estimated Completion Date (ECD): 15 Sept 2017.

4a. (U) Background/history: During 2014 and 2015 the program office was attempting to incentivize the contractor to process the aircraft through the PDM facility at a faster rate and reduce cost. The Fee Determining Official (FDO) decision allowed more than 100% of award fee based on the terms of the Award Fee Plan in effect during the 2014 and 2015 periods to arrive at the earned award fee and FDO approved fee determination.

4b. (FOUO) HBKAA will consult with legal counsel to determine if the request for recovery of the \$7.6M is appropriate and can be handled under the Disputes Clause of the Contract or through the procedures defined under the DFARS PGI 242.7100.

d. (U) Conduct periodic reviews of the Joint Surveillance Target Attack Radar System (JSTARS) Total System Support Responsibility contract to ensure its compliance with the Federal Acquisition Regulation and Air Force guidance.

1. (U) Concur with recommendation 1d.

2. OPEN.

3. (U) Estimated Completion Date (ECD): 31 Oct 2016.

20 September 2016

Page 2 of 4

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Department of the Air Force Comments (cont'd)

Final Report Reference

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DoD-IG

Report Of Audit (ROA)

C2ISR Division (AFLCMC/HBG)

The Air Force Needs to Improve Cost Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS), Project D2015-000AJI-0263.000

4a. (U) Generally, the terms and conditions included in the contract at the time of award remain in effect unless a change is prescribed by statute or other regulation. Task orders under the TSSR contract are negotiated on a yearly basis. AFFARS 5301.90(a)(7) establishes clearance requirements for these task orders. Pursuant to AFFARS 5301.9001(a), the objectives of the business and contract clearance process are to ensure that: (1) contract actions effectively implement approved acquisition strategies; (2) negotiations and contract actions result in fair and reasonable business arrangements; (3) negotiations and contract actions are consistent with laws, regulations, and policies; and (4) an independent review and assessment for the proposed contract action is accomplished. Prior to task order issuance, legal and contract policy reviews occur to ensure compliance with Federal Acquisition Regulation and Air Force Guidance. These reviews are followed with an approval by the SSCO to commence negotiations. JBKAA will ensure the JSTARS TSSR contract is fully compliant with Federal Acquisition Regulation and Air Force guidance.

2. Recommendation 2: (U) We [DoD-IG] recommend that the Program Executive Officer for Battle Management [AFLCMC/HB]:

a. (FOUO) Develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the JSTARS contracting officer in determining whether contractor-proposed over and above work is appropriate.

1. (U) Concur with Intent with recommendation 2a.

2. **CLOSED.**

3. (U) Actual Completion Date (ACD): **01 Dec 2015**.

4a. (FOUO) Background/History: The TSSR contract put the Contractor in near total system control of the airframe (to include appropriate over and above work) with minimal Government oversight. As such, the program office was not staffed to provide on-site depot technical support.

4b. (FOUO) HBG has requested additional manpower (DCMA and program office) to provide on-site depot technical support. In the interim, the program office has increased Government temporary duty visits to the depot, as well as added in-depth reviews of aircraft undergoing depot maintenance. Travel for the program office to support the increased presence at the depot began on December 2015. Engineering has specifically supported major milestone events such as the E-8 Corrosion Survey, Fuels Symposium and Aircraft Gate Reviews.

b. (FOUO) Language from Recommendation 2b as it appears in DoD-IG draft ROA dated 24 Aug 2016 is stricken and replaced as follows per 13 Sep 2016 agreement between AFLCMC/HB, SAF/A5-8, AQI and SAF/FMP, and DoD-IG. The new language will appear in the "final" ROA to be issued by DoD-IG. Subparagraphs 2b(1), (2), (3) and (4) are

**Revised
Recommendation 2.b
on page 26**

20 September 2016

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Department of the Air Force Comments (cont'd)

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DoD-IG

Report Of Audit (ROA)

C2ISR Division (AFRLCMC/HBG)

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS), Project D2015-000AH-0263.000

in reply to the new language. *"Direct the program manager for the Joint Surveillance Target Attack Radar System to perform a service life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate potential operational mission gaps until the Next Gen JSTARS Recapitalization Program achieves full production."*

1. (U) Concur with recommendation 2b.

2. OPEN.

3. (U) Estimated Completion Date (ECD): 01 May 2017.

4a. (FOUO) Background/History: The fuselage is one of the primary service life limiting structures on the E-8C. Widespread Fatigue Damage (WFD) of the fuselage structure is the concern due to the age of the E-8C aircraft. HBG tasked Boeing to perform the WFD analysis on seven sections of the fuselage in February 2016. The study is scheduled to be completed by March 2017.

4b. (U) After the Air Force assesses the data from the Boeing study, HBG will use the data to determine the requirements to extend the E-8C service life. This will include funding requirements and schedule associated with potential service life extension activities required to keep the fleet operational.

3. Recommendation 3: (U) We [DoD-IG] recommend that the Program Executive Officer for Battle Management [AFRLCMC/HB] direct the Joint Surveillance Target Attack Radar System (JSTARS) program manager [HBG], with support from the Joint Surveillance Target Attack Radar System (JSTARS) Contracting Officer [HBKAA], to revise the sustainment metric requirement on the follow-on contract for Total System Support Responsibility contract option period 17 linking the aircraft availability metric requirement to the Air Control Wing user's desired outcome for aircraft availability in accordance with the Performance Based Logistics Guidebook.

a. (U) Concur with recommendation 3.

b. OPEN.

c. (U) Estimated Completion Date (ECD): 31 Oct 2016.

d. (FOUO) HBG has proposed changing TSSR Year 17 aircraft availability award fee criteria from a Deviation in Total Aircraft Possessed Days (DAPD) to a Work in Progress (WIP) metric. This change in evaluation criteria will directly tie NGC's award fee to the user's requirement of a target WIP of three aircraft in depot. This factor will also carry a 75% weight, the highest within the Award Fee Evaluation. The TSSR 17 Award Fee criteria will be implemented by 31 October 2016.

Department of the Air Force Comments (cont'd)



DEPARTMENT OF THE AIR FORCE
AIR FORCE LIFE CYCLE MANAGEMENT CENTER
HANSOM AIR FORCE BASE MASSACHUSETTS

23 September 2016

MEMORANDUM FOR HQ AF/PMP/AQ/AG
PENTAGON
WASHINGTON DC 20330-1130

FROM: AFLCMC/IIBF
5 Eglin St, Bldg 1624
Hanscom AFB MA 01731-2115

SUBJECT: (U) Addendum to Management Comments Recommendation 2b, DoD-JG Draft Report Of Audit (ROA), *The Air Force Needs to Improve Cost-effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS)*, Project D2015-000AH-0263.000.

References: (a) Email by [REDACTED], OIG DoD, 13 Sep 2016 (1512 hours), regarding Rec. 2b.
(b) BM and AFLCMC/IIBG Memos, 20 Sep 2016, same subject.

1. (U) At the request of [REDACTED], OIG DoD, in referenced email, the following is submitted as administrative clarification and rationale for negotiating a change to the language of Recommendation 2b as it appeared in original draft ROA released 24 August 2016.

2. (U) This administrative action is submitted in collaboration with [REDACTED], HAF/A58, and by permission of [REDACTED], Chief, C2ISR Division (HBG) Robins AFB, GA.

3. (U) Paragraph 2(b)(4)(c) is ADDED to AFLCMC/HBG management comments (20 Sep 2016):

4c. (U) The original language to Recommendation 2b was re-negotiated with DoD-JG for the following reasons: re-hosting the extant PME onto an alternate airframe would require extensive re-engineering, modification, and testing on that new airframe which would likely take as much time as the JSTARS EMD phase because airframe vendors or system integrators would be starting cold. Furthermore, the process to secure funding for such an effort would consume a considerable portion of the timeline between now and the Recap FOC. Lastly, funding the development and procurement of such an alternative would directly drain resources needed for the Recap program, extending or completely compromising that effort.

4. (U) Direct questions to [REDACTED] or the Battle Management (IIB) Directorate APP, [REDACTED], AFLCMC/IIBF, COM [REDACTED]

X Scott J. Chapman

SCOTT J. CHAPMAN, NH-III, DAF
Battle Management Audit Focal Point (AFLCMC/HB)
Signed by: CHAPMAN.SCOTT.J.1006750016

cc: HQ AFLCMC/TZQF Audit Focal Point
AFLCMC/IIBG/IIBGC

Department of the Air Force Comments (cont'd)



DEPARTMENT OF THE AIR FORCE
Air Force Sustainment Center
Directorate of Contracting
Robins Air Force Base, Georgia

SEP 23 2016

MEMORANDUM FOR: Office of Inspector General, Department of Defense

(U) SUBJECT: DoD IG Draft Report of Audit; JSTARS Project D2015-000AH-0263.000

(U) 1. I have reviewed the proposed response to subject report that is contained in the HBG memo dated 20 Sep 2016. I concur with the response as it relates to Recommendation 1 of subject report.

(U) 2. If you have any questions please contact the POC [REDACTED] at com: [REDACTED]
[REDACTED] DSN [REDACTED]

[Signature]
ANTHONY J. BAUMANN, SES
Director of Contracting
Senior Center Contracting Official

Acronyms and Abbreviations

AFLCMC	Air Force Life Cycle Management Center
C2ISR	Command and Control, Intelligence, Surveillance and Reconnaissance
DAPD	Deviation in Total Aircraft Possessed Days
DCMA	Defense Contract Management Agency
EAC	Estimate at Completion
FAR	Federal Acquisition Regulation
JSTARS	Joint Surveillance Target Attack Radar System
LCMMC	Lake Charles Maintenance and Modification Center
PEO	Program Executive Officer
PMO	Program Management Office
PBL	Performance-Based Logistics
TSSR	Total System Support Responsibility

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